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The Effects of Exfloration on the Soybean

Stanley Austin
State University of Iowa

the sum of oxygen and carbon dioxide was 20.9, the normal oxygen content of the atmosphere.

The respiration quotient of Carrington loam under various treatments was determined, using a Haldane microgas analysis apparatus for the measurements. The average respiration quotient for untreated Carrington loam was 0.87; for Carrington loam treated with cellulose 0.83; and for Carrington loam treated with dextrose 1.27.

IOWA STATE COLLEGE,
AMES, IOWA.

THE SOMATIC CHROMOSOMES OF CYPRIPEDIUM HIRSUTUM AND SIX SPECIES OF HABENARIA

L. M. HUMPHREY

The chromosome numbers of eight species of the *Orchidaceae* were reported last year. The purpose of this paper is to report seven more species. The material was collected in Minnesota and Massachusetts. The following numbers were found: *Cypripedium hirsutum*, $2n = 20$; *Habenaria blephariglottis*, $2n = 42$; *H. clavellata*, $2n = 42$; *H. dilatata*, $2n = 42$; *H. Hookeri*, $2n = 42$; *H. hyperborea*, $2n = 42$; and *H. obtusata*, $2n = 42$. The size relationships are the same as in the species studied last year. The Cypripedium has very large chromosomes, and the Habenarias relatively very small ones.

DEPARTMENT OF BOTANY,
IOWA STATE COLLEGE,
AMES, IOWA.

THE EFFECTS OF EXFLORATION ON THE SOYBEAN

STANLEY AUSTIN

Most of the literature on growth and reproduction in plants leaves the implication that cessation of vegetative activity in plants of an indeterminant type of growth is due to the drain of nutrient materials imposed on the plant by the developing fruits. This is not true for the soybean. The variety used in this investigation flowers early and continues to grow for some time afterward and

appears to cease growing as the fruits mature. However, plants from which the flowers are continuously removed increase in percentage of dry weight at the same rate as the controls and stop growing at the same time. A very large reserve of carbohydrates accumulates in the stems of exflorated plants and is nearly equal to the total amount in the control plants plus their fruits. The controls assimilate much more nitrogen and minerals than the exflorated plants so that the development of fruits does not greatly lessen the amounts of these substances in the vegetative parts of the plants. Maturity of the soybean plant may result from some indirect effect of the length of day or possibly to some growth inhibiting substance secreted by the flowers, but it is certainly not due to the diversion of nutrient materials to the developing fruits.

DEPARTMENT OF BOTANY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

PERENNIAL SOW THISTLE (SONCHUS ARVENSIS L.) IN IOWA

ADA HAYDEN

Perennial sow thistle (Sonchus arvensis L.) has wide geographical distribution. It occurs throughout Europe to 70° 35′ North, in Siberia, Caucausus and lower Asia to Afghanistan. It is naturalized in India, Ceylon, Japan, North Africa, Australia, New America. Perennial sow thistle thrives in cultivated and uncultivated ground and in a wide range of soils. Its seeds have a high percentage of germination, without requiring a rest period. The plant may be propagated from cuttings of the root less than half an inch long as well as from the short upright rootstocks. The flowers are perfect; in seven days after they open under ordinary field conditions during midsummer, the seed is mature. This cosmopolitan with its variety *levipes* Koch has been known to occur in 25 counties in Iowa. Locations in which it has gained a foothold are lumber yards, elevators, stockyards and railway stations, where it occurs in small patches. While perennial sow thistle is not yet commonly established in Iowa fields, its habits of growth and propagation fit it for adaptation and rapid spread in a wide range of environment.

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IOWA STATE COLLEGE,
AMES, IOWA.